



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,258	09/30/2003	Seung H. Kang	Ayukawa 1-4-1-162-30/0759	4017
29391	7590	06/21/2006	EXAMINER	
BEUSSE WOLTER SANKS MORA & MAIRE, P. A. 390 NORTH ORANGE AVENUE SUITE 2500 ORLANDO, FL 32801			LE, THAO X	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 06/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/675,258

Applicant(s)

KANG ET AL.

Examiner

Thao X. Le

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-26 is/are pending in the application.
- 4a) Of the above claim(s) 17-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-16 and 26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 10 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The original specification fails to disclose the limitation "wherein the passivation layer is further disposed between the second interconnect structure and an uppermost level of the metallization interconnect system"

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

((b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-5, 8-9, 12-16, and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by US 6229221 to Kloen et al.

Regarding claims 1, Kloen discloses an integrated circuit (IC) device in fig. 1-2 comprising: a semiconductor substrate 6, col. 3 line 57, a multi level metallization interconnect system 16/19/23, col. 4 lines 6,10, 46, overlying the semiconductor substrate 6, each level thereof comprising first interconnect structures 19, col. 4 line 11, a bond pad level 3/22/23 comprising a plurality of contact pads 3, fig. 1 column 4 line 39, overlying the metallization interconnect system, fig. 2, one or more of the plurality of contact pads 3 configured for connection external to the device, col. 4 line 33, fig. 2, and a second interconnect structure 22, col. 4 line 28, connecting one of the plurality of contact pads 3 to a plurality of first interconnect structure 19, fig. 2, wherein a portion of the second interconnect structure 22 is disposed in the bond pad level and connected to each one of the plurality of first interconnect structures 19 through a conductive via 21, col. 4 line 29, fig. 2.

Regarding claims 2-3, and 13-14, Kloen discloses the IC device wherein a material of the multilevel metallization interconnect system comprises copper, col. 4 line 12, wherein a material of the contact pads and the second interconnect structure level comprises aluminum, column 4 line 47.

Regarding claims 4-5, Kloen discloses the IC wherein the plurality of contact pads are configured for connection external to the device by a bond wire 24 and by a solder bump, fig. 2, attached to one or more of the plurality of contact pads, fig. 2.

Regarding claim 8-9,15-16, Kloen discloses the IC device wherein the multilevel metallization interconnect system further comprises substantially horizontal conductive

runner 19, fig. 2, and substantially vertical conductive vias interconnecting overlying 21 and underlying copper, col. 4 line 12, conductive runner 19/16, fig. 2.

Regarding claim 10, Kloen discloses the IC further comprising a passivation layer 20, column 4 line 15, disposed between the bond pad level 3 and the metallization system 16/19, wherein the passivation layer 20 is further disposed between the second interconnect structure 22 power and an uppermost level of the metallization interconnect system, fig. 2.

Regarding claims 12, Kloen discloses an integrated circuit (IC) device comprising: a multilevel metallization interconnect system 16/19/23, fig. 2, each level thereof comprising first interconnect structures 19; a plurality of contact pads 3 disposed over an upper most level of the multilevel metallization interconnect system, one or more of the plurality of contact pads configured for connection external to the device, col. 4 line 33, and a second interconnect structure 22 coplanar with at least one of the plurality of contact pads 3 and electrically connected thereto, the second interconnect structure 22 comprising a plurality of conductive elements each connected to one of the first interconnect structures through a conductive via 21, fig. 2.

Regarding claim 26, Kloen discloses the IC wherein at least a portion of the second interconnects structure 22 is disposed above one or more of the plurality of contact pads 3, fig. 2.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 6 and 11 rejected under 35 U.S.C. 103(a) as being unpatentable over US 6229221 to Kloen et al. in view of Applicant Admitted Prior Art (AAPA)

Regarding claims 6 and 11, Kloen does not disclose the IC comprises a barrier material in regions of physical contact between the copper and aluminum and further comprising a passivation layer overlying the bond pad level.

However, AAPA discloses a IC comprises a multilevel metallization interconnect system comprises a barrier material 155, in regions of physical contact between the copper 146 and aluminum 156 [0031] and further comprising a passivation layer 158 [0032] overlying the bond pad level. At the

time the invention was made; it would have been obvious to one of ordinary skill in the art to use barrier and passivation teaching of AAPA with Kloen's device, because the barrier layer would have prevented the interaction between the copper and aluminum layers as taught by AAPA, [0031], and passivation layer would have provided the protection to the aluminum layer and or for further interconnecting layer.

### ***Response to Arguments***

8. Applicant's arguments filed 05 May 2006 have been fully considered but they are not persuasive. The Applicant argues that Kloen fails to disclose a second interconnect structure connecting one of the plurality of contact pads to a plurality interconnect structures, wherein a portion of the second interconnect structure is disposed in the bond pad level and connected to each one of the plurality of the interconnect structures through a conductive via. This is not persuasive because Kloen discloses in fig. 1 and 2 a second interconnect structure 22 connecting one of the plurality of contact pads 3 to a plurality interconnect structures, wherein a portion of the second interconnect structure 22 is disposed in the bond pad level 3 and connected to each one of the plurality of the first interconnect structures 19 through a conductive via 21.

### ***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao X. Le whose telephone number is (571) 272-1708. The examiner can normally be reached on M-F from 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on (571) 272 -1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should



Application/Control Number: 10/675,258

Page 8

Art Unit: 2814

you have questions on access to the Private PAIR system, contact the Electronic  
Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, consisting of several overlapping horizontal and diagonal strokes, followed by a long horizontal line extending to the right.

Thao X. Le  
14 June 2006